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The General Design of the Columbian Exposition.

AT the request of the American Institute of Architects Mr. Frederick Law Olmsted has written a "Report upon the Landscape Architecture of the Columbian Exposition." We have not space for the entire paper, but it is so instructive that we feel impelled to present portions of it to our readers, although much of its original value is lost by any condensation. When the office of Landscape Architects to the Exposition was created it was assumed, in the absence of specific instruction, that the duties of that office were to reconcile the requirements of the problem which the Directors had before them in respect to buildings and the means of access to them, with the requirements of scenery, and of scenery which would be pleasing not because of the specific beauty of its detail but because of the subordination and contribution of these details to the effective composition of masses as seen in the perspective. When called to Chicago by the Directory to give counsel in selecting a site, Messrs. Olmsted & Codman were taken to examine the proposed sites. Inasmuch as the country immediately about Chicago is flat and mainly treeless with a tenacious clay soil, and a climate subject to sudden changes and severe winds, the demands upon the energy of vegetation is peculiarly trying, so that the selection of a site was necessarily a choice of difficulties. On this point the report goes on to say: "Of the seven sites to which our attention was called there was not one the scenery of which could recommend it if it had been near Boston, New York or Philadelphia. A brief review of them, however, showed that nothing was to be found on any of the four inland sites that could be weighed against the advantages in respect to scenery of the lake shore. As to the sites on the shore we concluded that, if suitable transportation for goods and passengers could be provided, the northernmost of the three proposed would be the best. It would require less outlay to prepare the grounds and establish means of interior transportation, water-supply and drainage; the great marine commerce of Chicago would be passing in review before it at a suitable distance for spectacular effect; an arrangement of buildings simpler and grander than possible elsewhere would be practicable here, and the buildings would have a much better setting and frame of foliage provided by standing woods, fairly vigorous and of sufficient height to serve as a continuous background."

The proper transportation arrangements, however, could not be made, and therefore the southernmost, or the Jackson Park, site was taken against much remonstrance. The superiority of an inland site known as Washington Park was thought to be so obvious that a leading member of the National Commission asserted, after an inspection of the two sites, that not one vote in ten could be secured for Jackson Park. After much argument by the landscape-gardeners, in which little was apparently accomplished, the result was, as stated in the report, "that the Commission in the end accepted our advice, not because a majority of its members understood the ground of it, but because they could not be led to believe that we should have given such advice without having, as experts, sound reasons for doing it. The result was, therefore, due to respect for professional judgment. Comparing this experience with some of my earlier professional life I can but think that it manifests an advance in civilization."

To ordinary observation, Jackson Park was a forbidding place. At different periods sand-bars had been formed in the lake a few hundred feet from the shore and parallel with it. The landward one of these, gradually rising, had at length attained an elevation above the surface of the water, and within this bar a pool or lagoon was formed. Gradually these lagoons had been filled nearly to the brim with drifting sand and had become marshes. Thus nine-tenths of the site—in fact, all of it that had not been artificially made otherwise—consisted of three ridges of beach-sand, with intervening swales occupied by boggy vegetation. Upon the two inner ridges vegetable-mold had gathered, and scattered groups of Oaks and other trees had sprung up. The largest of these was only some forty feet in height, for their growth had been slow in the bleak situation and water-soaked soil; they were feeble, and many of them dilapidated through limbs broken by gales. A more serious difficulty was found in the circumstance that the level of the water in the lake, and, therefore, in the marshes, fluctuated not only from day to day as the winds drew it off or backed it up, but its average level varied from year to year, and persons who had studied the matter predicted that in 1893 the elevation of the surface of the lake would be four feet higher than it was at the time when the plan was studied. It will be readily understood how difficult it was to forecast landscape-effects in a region of low shores without knowing within four feet what the level of the water was to be which was to wash them. In answering the question why the least park-like ground within miles of Chicago had been selected for a park twenty years before, the report states that it is a common thing with town governments, when they find bodies of land which are not favorable to the enterprise of dealers in building-lots, to regard them as natural reservations for pleasure-grounds, and to label them accordingly on their maps. The sites for the Central Park, the Morningside Park, the Riverside Park, Mount Morris Park, Tompkins Square and other public grounds in the city of New York were thus selected, and the same is true of the site of the Back Bay Park in Boston, Battersea Park in London, and practically of the Tuileries garden in Paris. Sites having thus been obtained, landscape-gardeners are asked to contrive how pleasure-grounds can be made of them. "In the millennium it may be hoped that expert advice will be asked to select the land with regard to the specific purpose for which it is to be used, and when this is the case the making of the park will be less costly than it is at present."

More than twenty years ago, when the land and water of Jackson Park was first acquired, Messrs. Olmsted & Vaux devised a plan for making it available as a pleasure-ground, together with the site now known as Washington Park and the

strip of land between them now known as the Midway. The fundamental idea of this design was to re-open the old lagoons, to take the material lifted out to form the basis of higher banks on the old sand-bars, then to move through the Midway to the inland park, lifting out the material needed to open a channel in which dredges could float, and so shifting its material on the one side or the other as to provide varying shores which were afterward to be covered with soil and vegetation. When Jackson Park was chosen as the site of the World's Fair, none of this general landscape-design had been executed, but it was thought that if the element of water-ways in the original plan could be carried out, and retaining-walls built for holding excavated material which was piled upon the shores, terraces could be formed, and the buildings of the Fair could be advantageously distributed upon the surrounding ridges. The feasibility of this plan was confirmed by counsel with Messrs. Burnham & Root. Where lagoons with shores of a natural character would be unsuitable for boats, it was thought best to give them the character of canals, that is, to make them formal and give their banks, which would necessarily be walls, an architectural character in harmony with the buildings. With these points established, the development of the leading features of the design followed. First, the great architectural court with its body of water, which should be a dignified and impressive entrance-hall to the Exposition through which all visitors were to pass; then the canal extending northward to the broader waters, giving a water-frontage as well as a land-frontage to the principal buildings; and, lastly, the wooded island, with its natural sylvan aspect and its shores bordered with plants, which would endure occasional submergence and yet survive the withdrawal of water from their roots.

Even at this early period the result which has since been attained was fully anticipated in a general way. The effect of the boats and water-fowl as incidents of movement and life on the waters, the bridges with their shadows and reflections, their effect in extending perspecspectives and in tying together terraces and buildings, thus increasing unity of composition—all this was fully taken into account from the first, even the style of the boats best adapted to the purpose becoming at once a topic of study. When the Advisory Board of Architects, with Mr. Hunt as chairman, met, the landscape-gardeners were made members of the Board, and the plan came up for critical review. Many suggestions and counter-suggestions were made, and the balance of advantages weighed, but the result was at last a cordial approval of the original plan. This was modified afterward, so far as the abandonment of a proposed outer harbor was concerned, and, in another particular, modified to its injury. The landscape-gardeners all thought, and Mr. Codman was particularly strong in the conviction, that it was an unfortunate circumstance that visitors so generally entered the Paris Exposition at points not adapted to give them a grand impression, or provide for a convenient point of dispersal. The first step, therefore, in revising the old park-plan to the requirements of the Fair was to fix upon a focal point of interest a centre which should be so placed that conveyance by land and water, by railway and boats, both within and without, should conveniently discharge visitors into it and receive them from it. That it should be a place of general exchange, and the source of information and guidance as well as the point of departures and returns, a spacious court was provided, the Administration Building was placed in this court, the buildings likely to be most frequented opened into it, the intramural railway had its principal station in it, and the whole interior water-system was planned with a view to easy connection with it by small boats. All railways and steamboats were to receive and discharge passengers through it, and a union station was provided with this object in view. The failure to carry out this plan completely has, in Mr. Olmsted's opinion, cost the Exposition much, and deducted much from its value. The reason that this part of the scheme failed seems to be due to a lack of co-operation on the part of the Illinois Central Railway.

When the general plan was formed space was reserved for smaller buildings which it was supposed would be needed, but many such structures which were not then contemplated were ultimately scattered about between the main buildings. It was the original intention to leave the wooded island free from all objects that would prevent it from presenting, in connection with the waters about it, a broad space characterized by calmness and naturalness, to serve as a foil to the artificial grandeur and sumptuousness of the other parts of the scenery. Perhaps it is fortunate that no more obtrusive and disquieting introductions than the temple and garden of the Japanese and the horticultural exhibits were admitted to the island; nevertheless, these have injured it for the purpose of the design, and if they could have been avoided the Exposition would have made a more agreeable general impression on visitors of cultivated taste. Many of the smaller structures—pavilions and buildings, inserted without consulting the landscape-gardeners—are placed where they intercept vistas and disturb spaces intended to relieve the eye from too constant demands upon the attention made by the Exposition buildings. The effect of these little structures among the larger ones has been bad. It was the original intention to use on the grounds much more gardening decoration in various forms than has been used. Materials were provided for this purpose, at great expense, largely in the form of plants propagated and kept through the winter under glass, but when the time approached for using them the spaces in the grounds not occupied by the larger buildings and trees, appeared everywhere too much divided and disturbed by little features which were intended to be more or less decorative in their character, and, therefore, after consideration, it was reluctantly concluded that the intended floral decoration would add so much disquiet to the already excessive disquiet of the scenery that they would detract from the effect of the more massive elements, and had to be abandoned.

The administration at one time contemplated the introduction of a branch railway by which Illinois Central trains could be taken from the Midway station up on the main court through the Fair-ground. To make room for this road the position assigned to the Horticultural Building had to be changed, the breadth of the lagoon was reduced and the outline of the island modified. The railway project was abandoned, but work had been done which compelled adherence to the unfortunate revision of the shores. The cramping of the water at this point has been a considerable loss, and had the advances and recesses of the foliage masses beside the Horticultural Building been much greater than they are a more picturesque effect would have been obtained.

In measuring the work of the landscape-department we should remember that, among various other considerations, the resources available in any large capital of Europe were not at command in Chicago, and the work had to be pushed rapidly with unknown and untrained men. After all the operations of grading, draining and top-soiling the land, the great bulk of the planting operations had to be completed in one fall and spring, two years being the longest time at command in any part of the grounds, and yet it was necessary to avoid the weak and sickly appearance so often seen in freshly made plantations. Besides this, unknown conditions of climate had to be met, such as possible rains and floods and frosts in the planting season; there was no certainty as to the behavior of the bottom and banks of excavations, where there were slips and uprisings of the sand from subterranean springs; there were no data to estimate the amount of ice which put the life of water-plants in peril along the shore. Several miles of raw, newly made shore had to be covered with a graceful and intricate green drapery of varied tints and pleasing in its shadows and reflections, and yet no commercial agencies were

prepared to furnish the material. The chief reliance was placed upon Willows of the shrubby sorts, in large variety, and such herbaceous bog and water-side plants as Flags, Cat-tails, Rushes, Irises and Pond-lilies, most of which had to be gathered for the purpose from localities on the shores of lakes and swamps in Illinois and Wisconsin. In this work 100,000 Willows, seventy-five car-loads of herbaceous plants, 140,000 other aquatic plants, and nearly 300,000 Ferns and other herbaceous plants were used.

Mr. Olmsted's report concludes with a hearty commendation of Mr. Rudolph Ulrich, who has been the chief executive in carrying out this work, and to whose discretion the carrying out of the particulars of the plan was largely due. He has entered admirably into the spirit of the design, and the zeal and skill with which he has carried on rapid work in an emergency can hardly be too highly praised.

Altogether, one cannot read the report without a renewed sense of gratitude that, in a critical occasion like the preparation for this great Exposition, the country could command the services of artists of the rank of Messrs. Olmsted & Codman, and that they were selected to make a design which should comprehend the entire scheme, and that in the construction so few departures from the plan were permitted.

Few Americans who take any interest in agricultural science cross the Atlantic without paying a hurried visit, at least, to Rothamsted Farm, some twenty-five miles from London, where the important experiments of Sir John Bennet Lawes and his colleague, Dr. John Henry Gilbert, are in progress. The Rothamsted experiments are of more than national importance, for Sir John Lawes set out fifty years ago to investigate some of the most obscure problems in the nutrition of plants and animals, and in the exhaustion and possible recuperation of the soil—problems on the solution of which successful agriculture must always depend. To this study he has devoted a long and patient life, each year adding to the mass of data which are collected with the utmost care by analyzing crops and soils and soil-water, and by other records made with an accuracy and completeness never excelled in the records of scientific investigation. Problems of this sort require so much time and forethought for their investigation that serious attempts at their solution would never have been undertaken, much less pursued with unfaltering zeal, except by a man like Sir John Lawes, who combined in his single person a scientific temper, a broad public spirit, an enthusiastic love for the work, and an ample fortune to enable him to carry out his plans. Already these experiments cover half a century, but, not satisfied with this, Sir John has dedicated to their prosecution his famous laboratory, together with the experimental farm, with an endowment of half a million of money, all of which are handed to some of the most distinguished scientific men of the age for their future administration. It was fitting, therefore, that a distinguished gathering, headed by His Royal Highness the Prince of Wales, should meet, as they did recently at Harpenden, to commemorate the fiftieth anniversary of the Rothamsted experiments, by dedicating a granite memorial to Sir John Bennet Lawes and Dr. Gilbert.

Sir John Lawes is greatly interested in American agriculture, and he has been a frequent contributor to the agricultural press of this country. Dr. Gilbert has visited us in former years and addressed many agricultural and scientific meetings, and we are pleased to learn that he is about leaving England for Chicago, where he has undertaken to deliver a course of lectures on scientific agriculture, as taught by the Rothamsted experiments. As this work at Rothamsted has been of world-wide service, there is no man in all the world who takes an intelligent interest in agriculture or horticulture who will not unite with us in wishing that the lives of these two benefactors of the race may be extended through many fruitful years.

White Huckleberries.

In Garden and Forest (vol. ii., p. 50) I called attention to the occurrence of white berries of Vaccinium Canadense at Shelburne, New Hampshire. In that case microscopic examination showed that the white color was not due to the presence of a fungus, but was merely a form of albinism, as appears also to have been the case in other instances of white blueberries recorded in America. The production of white berries in species of Vaccinium in Europe is not rare, and the reader interested in the subject will find a list of localities in the paper by Ascherson and Magnus, "Die weissfrüchtige Heidelbeere," in the *Verhandl. Zool. Bot. Gesell*, Vienna, 1891, 679. Inasmuch, however, as in Germany a peculiar form of white indurated berries of Vaccinium Myrtillus was shown by Schrœter in 1879 to be due to the attack of the fungus Sclerotinia baccarum, and since, in 1888, Woronin described in the Memoirs of the Imperial Academy of St. Petersburg a number of similar diseases of other Vaccinia, it became a matter of interest to know whether the same, or similar fungus diseases, did not also occur in this country where Vaccinia abound, and have a certain value as articles of food.

Since my notice in Garden and Forest I have watched not only the wild huckleberries and blueberries, but also those sold in the markets, in search of the so-called white berries, and I found two years ago that they were common and easily recognized when they have once been detected. In the Boston market the huckleberry is especially affected. The berries are not white throughout, as in the case of the albino berries, but have circumscribed, often sunken, white spots, with usually a pink border. The spotted berries are at times so abundant as to injure the appearance of a dish of berries, and it is awkward to be obliged to pick out and reject the diseased berries, which are seldom removed in the kitchen. I have also noticed the spots on the fruit of V. Pennsylvanicum, and occasionally on V. vacillans.

Microscopic examination showed an abundance of the mycelium of the fungus causing the trouble, but it was impossible to distinguish the species since the spots are of the nature of Sclerotia and the perfect ascosporic form of the fungus does not occur in nature until after the berries have fallen to the ground, and are not easily recognized or collected.

Fungi of this genus have, however, a characteristic form of conidial fruit which develops on the young shoots and leaves in spring or early summer, and I was very glad on receiving from Mr. J. G. Jack some shoots of V. vacillans, collected at the Arnold Arboretum toward the end of last May, to be able to find a white powdery fungus which proved to be the conidia of a species of Sclerotinia. They resembled so closely in their microscopic structure the conidia of Sclerotinia baccarum, as figured and described by Woronin, being nearly spherical, with very small disjunctors, and growing in no case on the leaves, but always on one side of the youngest shoots, that, even in the absence of the ascosporic form, we may consider the fungus on V. vacillans to be the same as that of V. Myrtillus in Europe. Whether the spots on V. Pennsylvanicum and Gaylussacia resinosa are caused by the same species of fungus needs further inquiry. In Europe species of Sclerotinia are recorded on Vaccinium Vitis-Idœa and V. Oxycoccus, both of which are well known in this country under the names of Mountain Cranberry and small Bog Cranberry. But, so far as is yet known, white spots of Sclerotinia have not been observed on the berries of either of those species in this country.

W. G. Farlow.

Notes on the Forest Flora of Japan.—XX.

Of the Oak family it is in Carpinus only that the forests of eastern Asia are superior to those of America, where we have a single species of Hornbeam, a small tree confined to the eastern side of the continent. Europe pos-

sesses, also, a single species which extends to the Orient, where a second species is found. The forests which cover the Himalayas contain two species; at least two or three others are found in the Chinese empire; and to the flora of Japan six species are credited. One of the Japanese species, however, Carpinus erosa of Blume, is a doubtful plant; another, the Carpinus Tschnoskii of Maximowicz, from the Hakone Mountains and the region of Fugi-san, I have never seen; and a third, Carpinus Yedonsis, a small tree cultivated in gardens in the neighborhood of Tōkyō, is, perhaps, like many of the plants cultivated by the Japanese, a native of central Asia. Three species are certainly indigenous to the Japanese soil.

Carpinus laxiflora resembles, in the character of the bark, the size and shape of the leaves, and in the structure of the flowers, the European and American Hornbeams. It is a graceful tree, occasionally fifty feet in height, with a trunk eighteen to twenty inches in diameter, covered with smooth pale, sometimes almost white, bark, and slender branches. The leaves are ovate or ovate-elliptical, rounded or subcordate at the base, contracted at the apex into long slender points, and doubly serrate; they are dark green above, pale yellow-green below, three to four inches long, an inch to an inch and a half broad, prominently many-veined, and in the autumn turn yellow or red and yellow. The fruit is produced in lax hairy catkins four or five inches long, with spreading, oblique, prominently veined bracts, which are obscurely lobed, more or less enfolded at the base around the fruit, and nearly an inch long. This fine tree is common in all the mountain-forests of Hondo, where it is most abundant at elevations between two and three thousand feet above the sea; in Yezo it reaches the southern shores of Volcano Bay, where, near the town of Mori, it is common in the Oak forests, and grows to its largest size.

The other Japanese species of Carpinus differ from Carpinus laxiflora and from the American and European species in their furrowed scaly bark, in the stalked bract of the male flower, in the closely imbricated bracts of the fruiting catkins, which look like the fruit of the Hop-vine, and in the form of these bracts, which are furnished at the base with a lobe which covers the fruit and is more or less enclosed by the enfolding of the opposite side of the bract. On account of these differences these two trees are sometimes referred to the genus Distigocarpus, founded by Siebold and Zuccarini to receive their Distigocarpus Carpinus.

The figure on page 365 of this issue shows flowering and fruiting branches of this tree, a staminate flower, and a bract of the fruiting catkin. Botanists now pretty generally agree that the characters upon which Distigocarpus was founded are not of sufficient importance to justify its separation from Carpinus; and Distigocarpus Carpinus, if the oldest specific name is used, becomes Carpinus Carpinus. By Blume, who first united Distigocarpus with Carpinus, it was called Carpinus Japonica, the name under which it has appeared in all recent works on the Japanese flora. It is a tree forty to fifty feet in height, with a trunk often twelve to eighteen inches in diameter, and wide-spreading branches which form a broad handsome head. The branches are slender, terete, coated at first with long pale hairs, and later are covered with dark red-brown bark often marked with oblong pale lenticels. The winter-buds are half an inch long, acute, and covered with many imbricated thin, light brown, papery scales; with the exception of those of the outer ranks they are accrescent on the growing shoots, and at maturity are nearly an inch long, and hairy on the margins. The leaves are ovate, long-pointed, slightly and usually obliquely cordate at the base, coarsely and doubly serrate, thick and firm, dark green on the upper surface, paler on the lower, three or four inches long and about an inch and a half wide, with stout midribs and many straight prominent veins slightly hairy below, and deeply impressed above. The stipules are linear, acute, scarious, an inch long, and covered with pale hairs. The male inflorescence is an inch long, with stalked lanceolate-acute bracts half an inch long, and more or less ciliate on the margins. The female inflorescence is two-thirds of an inch long, and is raised on a slender stem coated, like the bracts which subtend the ovaries, with thick white tomentum; the outer bracts are acute, scarious, a quarter of an inch long, and early deciduous; the inner bracts are oblique, coarsely serrate toward the apex, conspicuously many-ribbed, and furnished at the base with a minute ovate serrate lobe which covers the ovary. Before the fruit ripens these inner bracts enlarge until they are two-thirds of an inch long and one-third of an inch broad, and are closely imbricated into a cone-like catkin which resembles in shape, color and texture that of our American Hop Hornbeam; it is, however, often two or two and a half inches long. The nutlet is slightly flattened, with about ten straight prominent ridges extending from one end to the other.

Carpinus Carpinus is common in the Hakone and Nikko mountains between two and three thousand feet elevation above the sea; it apparently does not range very far north in Hondo or reach the island of Yezo. This interesting and beautiful tree, which is remarkable among Hornbeams in the character of the bark and in the female inflorescence, appears to be perfectly hardy in New England. For a number of years it has inhabited the Arnold Arboretum, and during the last two seasons has produced flowers and fruit here. In its young state it makes a handsome, compact, pyramidal, bushy and very distinct-looking tree.

But the most beautiful of the Hornbeams of Japan, as it appears in the forests of Yezo, is Carpinus cordata, which often attains the height of forty feet, with a stout trunk sometimes eighteen inches in diameter, covered with dark, deeply furrrowed scaly bark. The stout branchlets are orange color, or, when they are three or four years old, light brown, and are covered with large oblong pale lenticels. This species is remarkable in the size of its winter buds, which are fully grown by midsummer, and sometimes nearly an inch long, and are acute, and covered with light chestnut-brown papery scales. The leaves are thin, broadly ovate, pointed, deeply cordate, doubly serrate, six or seven inches long and three or four inches broad; they are light green on both surfaces, although rather lighter-colored on the lower, with conspicuous yellow midribs and veins slightly hairy below and impressed above. The catkins of fruit are often five or six inches long and an inch and a half wide, with broadly ovate, remotely serrate bracts; their basal lobe is proportionately much larger than that of the last species, and is sometimes a third of the length of the bract, to which it is often united along nearly its entire length, while in Carpinus Carpinus the lobe is only attached at the base.

This is the only species of central Yezo, where it is one of the common forest-trees, growing with Oaks, Magnolias, Ashes, Walnuts, Acanthopanax, Birches, etc.; it also grows in Hondo at high elevations, although it is here much less common than farther north. This fine tree is apparently still unknown in American and European gardens; it is one of the largest of the Hornbeams, and certainly one of the most distinct and beautiful of them all. As it grows in its native forests with a number of trees which flourish here in New England, it may be expected to grace our plantations with its stately habit, large leaves and long clusters of fruit. An abundant supply of the seeds, with those of Betula Maximowicziana, was the best harvest we secured in Yezo.

C. S. S.

Foreign Correspondence.

Notes on Water-lilies.

It may be "sending coals to Newcastle" for me to write about aquatic plants for American readers, but I am specially interested in Nymphæas and their relatives of the pond, and when I learn from Mr. Goldring and others who have been to America, as well as from the numerous interesting notes in Garden and Forest, that aquatic plants are greatly in favor in the United States, I

am tempted to say my say with regard to them. Yesterday I received a letter from a correspondent at Beaver Falls, Pa., in which the merits of different Nymphæas are discussed, and also revealing exceptional success in the management of some and failure with others. My friend, who is an amateur and a new hand at gardening, asks if cow-manure is good for Nymphæas, some one having said showed us that the "microbes" in the manure-heap and the diseased leaves were identical. We thought this conclusive, and so last year we grew our Victoria in good maiden loam without manure of any kind. The result was a plant of average health, but below average size both in leaf and flower. Meanwhile other growers used equal portions of cow-manure and loam for their Victorias and had plants

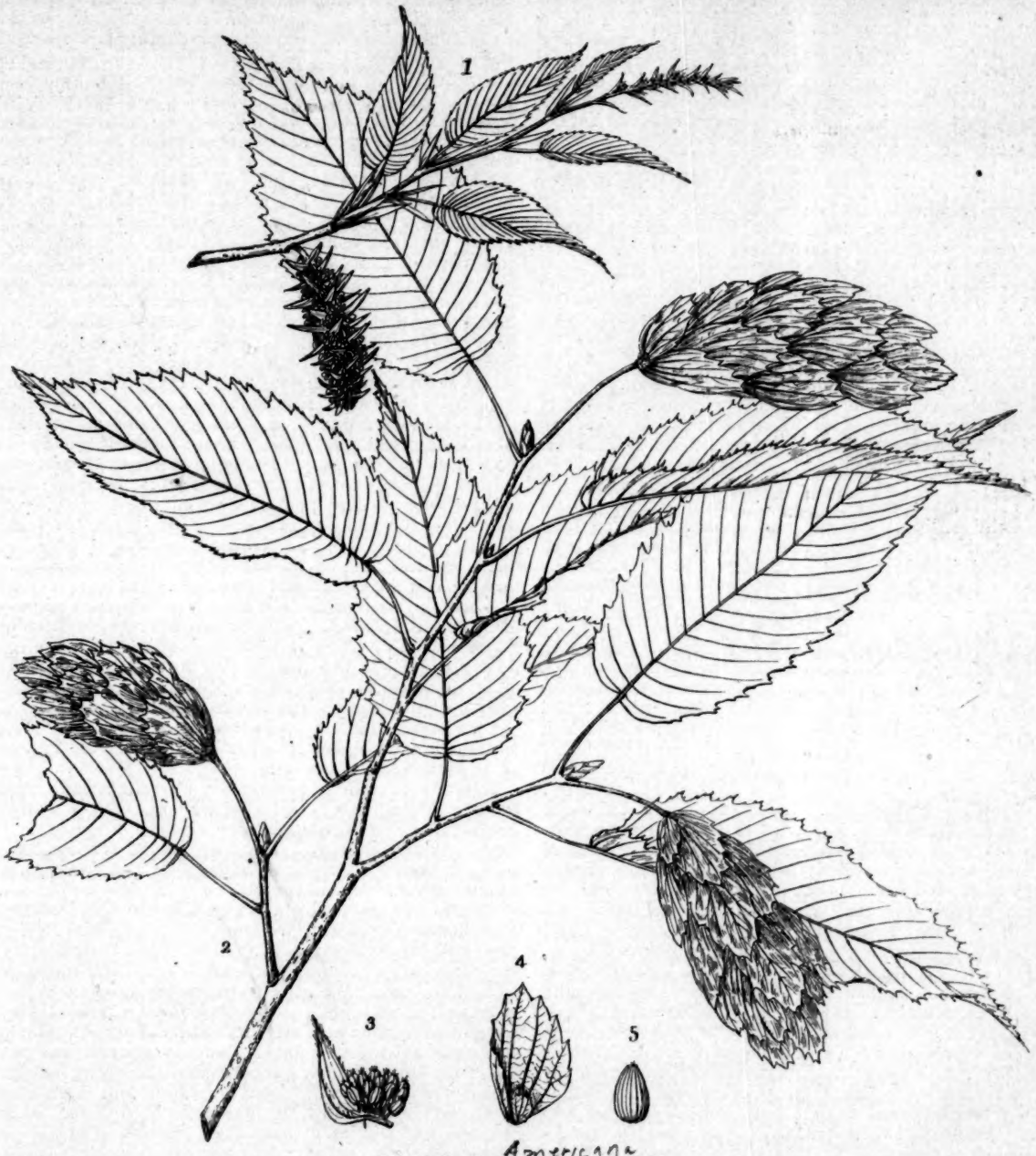

Fig. 56.—Carpinus Caroliniana.—See page 363.

1. A flowering branch, natural size. 2. A fruiting branch, natural size. 3. A staminate flower, enlarged. 4. A nutlet with its bract showing the basal lobe, natural size. 5. A nutlet, slightly enlarged.

that it was not. It is difficult to prescribe for sick plants, especially at a distance, and even when furnished with full details one is apt to ascribe sickness to the wrong cause. Here is a case in point: Two years ago our Victoria regia grew sick, and in time the leaves were all full of large holes caused by a species of spot. Various doctors prescribed for it or diagnosed the disease. The fungologist declared that the cow-manure was the cause, and in proof with leaves "as large and solid as billiard-tables." And so this year we returned to our microbe-infested cow-manure, half and half as usual, and there is no spot, no weakness, but a grand plant, as robust and healthy as I have ever seen. I am certain that cow-manure is an excellent ingredient for aquatics of all kinds, stimulating and promoting growth of both leaf and flower. To all growers of these plants I say do not be afraid of cow-

manure and be careful to use with it good fibrous loam. For our Nymphæas this year we have added a good sprinkling of inch-crushed bones, and they have grown exceptionally well and flowered most profusely. I counted seventy beautiful open flowers in our Nymphæa-tank a few days ago at ten o'clock in the morning, the high-noon of the Nymphæas, as the Lotus section have not then closed and the stellata section have just opened. Among our choicest kinds I reckon the white fragrant N. gracilis, a Mexican species which we obtained last year under the erroneous name of N. Mexicana. It is a very free-flowering species, does not occupy too much space, and is distinct from all other white-flowered Nymphæas, its nearest affinity in floral character being the white form of N. stellata known as N. Voalefoka. The delightful little Water-lily known as N. Laydekeri has found many admirers here. It is said to be of hybrid origin, but I suspect it is really a Japanese or Chinese introduction and is a not very distant relation of N. pygmæa, which is a native of northern China as well as India. Mr. Sturtevant, of New Jersey, has done much to promote a love for Nymphæas, and one of his best works in this direction was the production of N. Sturtevantii, a hybrid I believe from N. rubra and N. dentala. Its large apple-green leaves with short stalks give it quite a distinctive appearance when not in flower, but when its enormous blooms are open it surpasses in beauty most Nymphæas, the soft delicate pink with a creamy-yellow hue in the base of the broad petals suggesting the colors of that charming tea-rose, Marie Van Houtte. We have had this fine American production in cultivation since 1884, thanks to the generosity of Mr. Sturtevant, and the only fault I have to find with it is its sterility in regard to seed and its slowness to multiply itself by means of tubers. Of course, the sterling Lotus varieties known as N. dentata, N. rubra, N. Devoniensis, and N. Ortgiesiana are well represented in our tank. The hybrid N. Kewensis no longer exists except in effigy, the figure in the *Botanical Magazine*, t. 6917, being all that remains of this handsome rose-red hybrid which died while at rest three years ago.

Coming to the Nymphæa stellata forms, we begin with the king of them all, N. Zanzibarensis, which first flowered at Kew about twelve years ago. I remember well the incredulity of our late keeper of the herbarium when I told him one morning that we had a new Nymphæa with rich purple-blue flowers nine inches across. No Nymphæa better repays liberal treatment than this, the largest of flower-pots being too small for it. Planted in a large bed of rich soil, and allowed room to develop, it will cover almost as much space as the Victoria, and produce leaves two feet across. There are poor debilitated forms of it about, and there are some which are called varieties which are merely slight variations from the ordinary stellata. I am puzzled by such names as scutifolia, cyanea, cœrulea and parviflora, all the plants I have seen under these names, and I have seen and grown a good number from various sources, being practically identical. I have heard Sir Joseph Hooker describe the true scutifolia as a very distinct variety with broad petals, rounded, not pointed, at the tips, and colored clear blue, but I have never seen it alive. Any one who examines a large series of specimens of N. stellata such as that at Kew, which now includes the collection formed by the late Professor Caspary, the high-priest of the Nymphæa cult, will feel disposed to question a considerable proportion of the so-called varieties. We have what I consider four distinct varieties of N. stellata in cultivation at Kew, and they are N. Zanzibarensis, N. versicolor, a poor thing, distinct only in having more purple in the flowers than the type and with a streaky look; N. albiflora (Voalefoka), and one that we call the Berlin variety. This came to Kew from the Berlin Botanical Gardens years ago as N. Zanzibarensis. It is remarkable for the length of its flower-stalks, the flowers standing up as much as a foot above the surface of the water; they are larger than ordinary N. stellata, with numerous acute petals colored pale, almost Cambridge blue, with a cluster of pale yellow stamens. I once sent flowers of this to Professor Caspary, who said it must be of hybrid origin, though he would not even guess at its parentage. I believe it is only a well-marked variety of N. stellata, and I long ago classed it among the very best of all Nymphæas; as to size and attractive color of flower it adds a very free habit and the valuable character of flowering almost the whole year round. The forms of N. tuberosa and N. odorata are grown in the open air, and they have all flowered with unusual prodigality this year. But the enigmatical N. tuberosa, var. flavescens, which Monsieur Marliac, of Garonne-sur-Lot, insists is a hybrid, and has named N. Marliacea-chromatella, is a charming plant indoors as well as out. I may say at once that Professor Oliver, after very careful examination of this Nymphæa, unhesitatingly decided it to be a variety of N. tuberosa, and we have since called it by the above name. I think there is much to be said for this name in preference to the other, but that is a question which need not have attention here. I only wish to emphasize the fact that it is a most charming Water-lily, as beautiful in its way as Maréchal Niel Rose, very free in flower, and of the sturdiest constitution. We have it established in our lakes, where it is rapidly becoming as indifferent to ducks, geese, snails and cold weather as our native Water-lily, N. alba. It is equally beautiful in a tropical tank, flowering very freely all the summer through. The elegant N. flava grows with us, and blooms only rarely. There are two beautiful Nymphæas which Monsieur Marliac calls N. Marliacea rubra and N. Marliacea rosacea, and which are of the same good nature as N. tuberosa flavescens; they have large flowers, white, with a deep rose tinge, that named rubra being the darker of the two. I saw both these Water-lilies growing and flowering out-of-doors in the Trinity College Gardens at Dublin in June last, and Mr. Burbidge was delighted with them and full of their praises. They were also flowering in a tank in the open air at Glasnevin.

There is another blue Water-lily, Nymphæa gigantea, the Australian species, which fills the lagoons there with large turned-up leaves and correspondingly large elegant blue flowers, but does not grow to the same size under cultivation here. N. Amazonum, or blanda, a creamy white, very fragrant-flowered species, from South America, is also grown here. It is remarkable as an early closing Water-lily, the flowers opening in the evening and closing soon after sunrise next morning.

A word in conclusion for N. alba and its beautiful variety, rosea, once called Caspariana. This is hardy, of course, and it is exceptional in its refusal to grow in our tropical tank, although the rose-colored variety of N. odorata, the Cape Cod Nymphæa, grows and flowers freely along with the tropical species.

Permit me to make a suggestion to cultivators of these beautiful plants. We want red, white, pink, yellow, blue and purple Nymphæas that will open their flowers in the morning and remain open for at least the major portion of the day. We also want all these colors in hardy sorts. It is possible that our desiderata can be obtained by cross-breeding and selection, and the numerous collectors and cultivators of these plants in America are in the best possible position to accomplish this. The first thing to achieve is a cross between the Lotus and stellata species. So far as I know, this has never been done. N. stellata and its varieties expand their flowers a little before noon, and close at night; N. Lotus and its varieties expand at dusk, and close before noon. Probably a cross between the two would remain expanded all day.

Here are two cultural hints which may be useful: 1. Do not dry off your plants if you can keep them moist through the winter. They will be quite safe if placed under a stage in a greenhouse. 2. Keep the seeds dry in ordinary packets, and not in water. They will then retain vitality for several years.

London. *W. Watson.*

Cultural Department.

Seasonable Notes.

THE cool nights already prevalent indicate that we are on the verge of autumn, the season that, next to spring, brings with it most anxieties to the cultivator. Our first preparation for fall is to get the Violets under glass as soon as practicable, and at this time every plant of the winter-flowering double kind Lady H. Campbell is safely under glass, either in the frames or in the heated house. The showery weather, and consequent humid atmosphere, give the exact conditions favorable to the development of disease, traces of which are already visible. This removal of the plants enables us to keep off overhead moisture. I have tried every known means to circumvent this disease, but have come to the conclusion that there is no cure for diseased plants in an advanced stage, and it is a waste of time and labor to try remedies. Much can be done, however, to keep healthy stock from becoming weak by taking off all the runners at this season. These should be put in as cuttings in boxes of sandy soil and kept in cold frames all winter. A moderate freezing will not hurt them; ours were frozen for two months last winter. In the spring they were potted singly in small pots and kept in frames until planted out in May. In this way a single sash will hold a thousand runners, and one need not propagate from stock forced to produce to their utmost all through the winter months. In fact, the plants we have now have never known artificial heat. I am also of opinion that partial shade is of decided benefit to plants during the summer season; in infected districts the strain is not so great on the plants, and their constitution is not weakened so much in consequence where shade is afforded by trees or other means at midday.

Poinsettias are invaluable decorative plants for winter, and are particularly seasonable at Christmas. Our plants have been out-of-doors until now, but will be placed in the Rose-house at an early date. As soon as the cool nights give the foliage the least signs of wilting in the morning, just so soon do they need warmth to maintain the foliage on the plants until the bracts are developed. Poinsettias struck this season will make very useful little plants moved into four-inch pots to flower, but their chief value will be in the second season. If kept dry after flowering until midsummer and then started outdoors in frames, there will be several branches to each plant, each producing a good head. A night temperature of fifty-five degrees is most suitable to prevent a weak and attenuated growth. The so-called double Poinsettia is not worth growing. It is weaker in habit, does not retain the foliage so well, and the duplicate row of bracts is, in most instances that I have noticed, purely imaginary. A few plants of the white-flowered form are desirable wherever the typical plant is cultivated, for the sake of variety. The white form is equally as robust as the scarlet, and makes a pleasing contrast.

It has often been a matter of surprise to me that Lavender is not more generally grown in gardens. A single bush will produce a quantity of fragrant flowers, which are pleasing whether fresh or dried. In New England the plant is doubtful as to hardiness. I have known it to survive a winter, but much more often to die. We always lift the plants after the first few frosts have arrested growth, and place them in a cellar, the roots being covered with soil. In the spring they are taken out and replanted in rich soil, and three good cuttings of blossoms are obtained during the summer. These are laid in an airy shed to dry slowly, and are then ready for use. Lavandula vera is the kind grown. It is sometimes known as L. Spica, and is the kind mostly grown to produce the oil of commerce. It is also known as English Lavender, although, like the term English Iris, the plants have in either case no real claim to the name English, except that at various periods they have been largely cultivated in England, for they are not indigenous to that country. The French Lavender has a much broader leaf; it is more tomentose, and is, therefore, often known as L. lanata. The flowers are equally desirable for use, but for distillation they are of little value as compared with those of L. vera. Lavender is easily propagated by means of cuttings taken from a plant placed in a warm greenhouse. Only a very small percentage of cuttings from out-of-door plants take root, as the wood is too hard. Two-year-old plants ought to produce about one hundred spikes of bloom, and these should be cut as soon as the first flowers are open on the spike.

South Lancaster, Mass. *E. O. Orpet.*

Ferns Suitable for House-culture.

THE general cultivation of Ferns in a dwelling-house is a matter of some difficulty, the chief obstacle being the excessively dry atmosphere; this is especially the case when the dwellings are heated by a hot-air furnace, with direct radiation. There are, however, some species of Ferns that can be successfully grown under such conditions, providing proper attention is given to watering, which is probably the chief essential to success. An occasional sprinkling overhead, or dipping in a tub of water, will serve to remove dust from the foliage and also to promote a healthy growth.

An open soil of rather coarse texture, and not pressed too firmly in the pots, is needed for all such plants, for Fern-roots will not readily penetrate hard or clayey soil. A liberal quantity of drainage material should also be provided, broken pots, cinders, sandstone and charcoal being among the best substances for the purpose. As plants of this class are usually found in shaded localities, a very bright window is not advisable for their culture; but if there is no shaded window available, the Ferns may be placed behind the flowering plants for protection from the sun. It is more satisfactory in selecting Ferns for the window-garden to secure strong and healthy plants in three or four inch pots, rather than very small specimens, in the hope of watching them develop into their full beauty. Young plants of some species are much more delicate and are more easily injured than older and stronger plants.

Among the species adapted for window-culture are some of the Nephrolepis, or Sword Ferns, N. exaltata being particularly hardy in foliage and free in growth. In a strong specimen the fronds of this species are frequently three to four feet long, their color being dark green, and in habit nearly upright. N. davallioides and its crested form, N. davallioides furcans, are also admirable, and have long arching fronds that are even more graceful and elegant than those of N. exaltata. These plants are readily increased by division, and may also be used to advantage on a sheltered rock-work out-of-doors during the summer. Polystichium angulare proliferum is also an excellent sort for house-culture, making a strong and thrifty growth under reasonably good care, and seeming to be almost dust-proof. The proliferous habit of this variety is an interesting feature, the embryo plants or bulbels being produced near the base of the fronds. Many of the Maiden-hair Ferns are too tender for the window-garden unless protected by means of a case, but some of the species may be grown without special protection. The original Maiden-hair, Adiantum Capillus-Veneris, is among the most satisfactory, though I have also seen A. cuneatum kept in good condition in a window.

The Pteris include several good house-plants, the members of this genus, with but few exceptions, being of sturdy habit and easy to cultivate. The various forms of Pteris Cretica are among the hardiest members of this extensive group, and are particularly valuable for decorations. P. Cretica magnifica and P. Cretica albo-lineata are two of the best varieties, the variegated leaves of the latter being especially attractive, while the deep green and heavily crested fronds of P. cretica magnifica give a pleasant contrast. P. hastata may also be used to advantage, providing it is never allowed to become very dry, for one thorough drying will ruin all its present foliage and much weaken the succeeding growths. P. tremula and P. semipinnata are also admissible to the window-garden, though of much larger growth than those already named; P. tremula has some resemblance to the common Bracken, though not quite so coarse, and P. semipinnata has much-divided dark green fronds of peculiar construction, the pinnæ on one side of the leaflets being so much contracted as to appear to have been sheared off. All of the Pteris to which reference has been made are cool-house subjects, and are, therefore, less likely to feel the changes in temperature to which many dwellings are subject.

The Cyrtomiums include two good house Ferns, C. falcatum and C. caryotideum; both of these are nearly hardy and of most vigorous growth, the glossy green fronds of C. falcatum being especially beautiful. One or two of the Selaginellas may also be included in the list. S. Kraussiana is the most useful species for carpeting the surface of the soil, while S. Martensii is easy to grow and very pretty.

Holmesburg, Pa. *W. H. Taplin.*

Tigridias.

THE two new varieties of Tigridia which a few of our dealers are offering, T. grandiflora rosea and T. grandiflora liliacea, are both very handsome, with large showy flowers. They have not borne as many flowers as T. pavonia or the variety alba. I believe they are natural crosses between the other older varieties, because I have found both of these among plants of T. conchiflora, and not only good types of them, but flowers of various shades of red and yellow, so that occasionally it was hard to tell whether certain plants should be classed as T. conchiflora or T. pavonia. There were some

that seemed to be intermediate between the yellow and white, having a creamy shade, so that it would seem as if they might as well be placed with T. pavonia alba as with T. conchiflora. But this variation seems to be nearly all in T. conchiflora, with very little in T. pavonia. T. pavonia alba shows no varieties of shades. Occasionally a plant of T. pavonia or T. conchiflora is seen among the plants of the variety alba, but each plant of the variety alba is like all the rest, seeming not to have become mixed by the insects as the others have. The bumble-bees are the most numerous visitors of the Tiger Flower here, and I believe are aids to their fertilization. Occasionally honey-bees are seen among them, but only a few.

In the new T. grandiflora rosea the outer portion of the flower has a rosy tinge and the inner lighter variegations are yellow, while in the variety liliacea the outer portion of the flower is reddish purple and the inner variegation is light or nearly white. In all of the flowers that I have noticed rose and yellow go together, and white and reddish purple. I could not find a flower in which the inner variegation was white and the outer one rose. I believe that the variety Rosea is a cross between T. pavonia and T. conchiflora, and the variety called liliacea is between T. pavonia and the variety alba. Last summer in an old Mexican garden Mr. Pringle found a rose-flowered variety of T. pavonia which was so distinct from any other form of T. pavonia which he had seen that he secured a hundred or more bulbs. The flowers of this variety are not so variegated in their inner portion as in the variety Rosea above mentioned, but in what variegation there is, the yellow predominates.

Tigridia Van Houttii was first discovered by Mr. B. Roezl, about twenty years ago, in Mexico. A few seeds were sent to Belgium from which flowering plants were raised, and these were illustrated in a colored drawing in the *Flore des Serres*, of August 20th, 1875. Last year Mr. Pringle secured an ample supply of these bulbs from the original locality, where Roezl found this Tigridia, and I believe these are about the only plants of this species now in cultivation. The plant grows about ten feet high and bears in long succession fifteen to forty and perhaps not rarely sixty flowers; they are erect, open bell-shaped, lilac and purple, an inch and a half wide. The flowers are not striking. The lack of red, yellow and white, which so quickly catch the eye in the varieties of T. pavonia, are almost entirely lacking in this, and one might pass it in full flower without notice. Yet, upon examination, the flower is beautiful; its delicate markings of lilac and purple of various shades are so unlike those of all the other Tigridias that it is the more interesting, and who can tell how useful it may be in crossing with other species and in increasing the number of new varieties? Its flowers are more durable than those of most species and remain open late in the day when others are all closed.

After all has been said in favor of the other species of Tigridia, the little T. buccifera, which I believe is the only species yet found in the United States, is, in my estimation, second to none. It is certainly a most charming little plant, and if it could be had at reasonable prices would be offered by many dealers. It is very scarce.

Tigridia pulchella is also very distinct from the others. It is a shyer bloomer than most species, and bears from one to four or five flowers. The inner portion of its flower is in the shape of a cup, white, with purple spots, while the three outer segments are very dark purple, or almost black. The flowers vary in size from half an inch to an inch and a quarter or more across in the strongest plants.

Charlotte, Vt. *F. H. Horsford.*

Early-flowering Gladioli.—So far as I am aware, these are but little grown in this country. Those which deserve attention are hybrids of G. ramosus, and about thirty varieties are described in the best Dutch catalogues with names. In this climate they require to be planted in the fall, and covered with straw and with board frames during the winter. They then begin to bloom in June, and continue through June, July and August, and even into September. All the varieties show the three beautiful spots upon the lower petals, which indicate an ancestry of G. trinoculatus. The scarlet forms do not greatly differ in tone of color. The habit of the plants is very attractive. They do not require stakes, but droop gracefully like plants of Solomon's Seal. The flowers succeed each other slowly. They are in close double rows, and as many as twelve have been counted upon a single stem, growing closely together. Only a few seeds can be obtained without artificial fertilization. It would seem to be well worth while to attempt the production of hybrids with some of the finest varieties of G. Gandavensis. Bulbs of G. Bowiensis, imported from the New Plant and Bulb Company, at Colchester, England, some years since, produce flowers which closely resemble those of the well-known G. Brenchleyensis, but the color is a peculiar and beautiful softened scarlet, and is very attractive. The bulb makes five offsets, and no seeds have been ripened so far here. It may be worth while to note that seeds of G. Brenchleyensis are now to be had of the Erfurt seedsmen. They are probably grown in Italy, as they appear also in the Italian catalogues. I have grown a large number of seedlings, which, however, will not bloom during the present year. Seeds of Gazania splendens are now to be had, as is believed, for the first time. These probably, also, come from Italy.

Newport, R. I. *G.*

Correspondence.

Harvesting and Evaporating Raspberries.

To the Editor of Garden and Forest:

Sir,—On page 336 one of your contributors refers to a method of gathering black raspberries for evaporating, which appears to be a sort of jarring. (1) I should like to know just what the process is, and how extensively it is in use. (2) Are red raspberries evaporated to any considerable extent? Is there any objection to them for that purpose?

East Orland, Me. *Charles G. Atkins.*

(1) The harvester referred to is a sort of tray about three feet square, consisting of a light iron or wood frame covered with canvas. It is six or eight inches deep at the lower side, while the upper side is open. This is held obliquely under the bushes to catch the berries. In one hand the operator carries a wire hook, with which he draws the bushes over the tray, while in the other hand he has a wire loop covered with canvas, and inserted in a handle, somewhat resembling a lawn-tennis racquet, with which he knocks off the berries. The plan was first invented by Mr. Benedict, of Dundee, New York, and is extensively used among the berry-growers of that region. When harvested by this plan the berries are allowed to get quite ripe, and the field is gone over but twice, or, at most, three times, during the season. A good man will gather on an average about ten bushels of berries a day throughout the season, although where the berries are most abundant many more can be gathered. Many dried leaves and stems are knocked off with the berries, but these do no harm, for, after drying, the fruit is run through a fanning-mill. The berries are then picked over by hand, so that the fruit really goes to market in cleaner and better condition than when picked by hand. The cost is considerably less than hand-picking, and, above all, it permits this work to be done in localities remote from markets, or towns of any sort, which cannot be done when pickers must be depended on to gather the fruit.

(2) The true red raspberries, like Cuthbert, are rarely evaporated, for several reasons. They usually yield less fruit per acre than Black-caps; they will make only seven or eight pounds of dried fruit to the bushel; they change to a dull, unattractive color in drying; and there seems to be no established demand for them at paying prices. They make an excellent quality of evaporated fruit, however, and with a special guaranteed market might prove profitable. Varieties of the Rubus neglectus type, like the Shaffer, are better adapted to this purpose, because they yield large crops, and if picked a little green give more pounds of dried fruit to the bushel. The fruit is also more attractive in color and of equally good, though not just the same, quality.

Cornell University. *Fred. W. Card.*

Two Wild Fruits in North Dakota.

To the Editor of Garden and Forest:

Sir,—In the article, "Southern California Wild Fruits," by S. B. Parish (Garden and Forest, vol. vi., page 313), mention is made of two wild fruits whose character in southern California differs greatly from that of the same fruits in the northern portions of North Dakota.

The first fruit referred to is one of the Choke Cherries, Prunus demissa, accompanied with the suggestive remark that its

fruit is but a little more austere than that of its Atlantic relative. P. demissa, as found in North Dakota, especially in the more northern and broken regions, is a small shrub, very heavily loaded with good-sized juicy fruit that does not need the absence of all things luscious to render it palatable. Indeed, some of the plants bear fruit that, when fully ripe, entirely lacks the astringent qualities that need no description to one who has passed his boyhood in the Atlantic region and has been endowed with boyhood's appetite and curiosity. The second fruit is a Juneberry, Amelanchier alnifolia, which Mr. Parish describes as dry and hard and not to be compared with its juicy Rocky Mountain relative. The plant described is probably of the same species as the mountain form, but varies on account of local conditions. The same species growing here has the same characteristics as when found growing in the Rocky Mountains. While the fruit lacks the character and juiciness of Prunus demissa, it has some value as a dessert fruit, exceeding in size, quality and productiveness the Juneberry of the older states.

Agricultural College, Fargo, N. D. *C. B. Waldron.*

The White Grub in Lawns.

To the Editor of GARDEN AND FOREST:

Sir,—Allow me to add to your careful notes last week on the white grub, that attempts to destroy these pests under sod with kerosene were made some years ago on quite a large scale in Washington, and proved very successful. The kerosene emulsion was made in the usual way, and was diluted with twelve parts of water. This was applied liberally to the infested parts of the lawn, and for several days thereafter the same spots of ground were freely watered in order to carry the mixture down through the roots of the grass and into contact with the insects. The same experiment has been tried in several other places, and has been successful in all cases, so far as I have been able to learn. For use on small grass plots the remedy is quite feasible; on a large scale it would be altogether too expensive.

I have found a good top-dressing of kainit to be very beneficial to insect-infested lawns, and this can be washed down into the ground by sprinkling with water just as the kerosene emulsion is carried down.

New Brunswick, N. J. *John B. Smith.*

Zelkova Keaki.

To the Editor of GARDEN AND FOREST:

Sir,—I was much interested in Professor Sargent's instructive account of Zelkova Keaki, on page 323, and the accompanying figure. I regret to say that there is one drawback to the cultivation of this fine tree in America at present; like other members of the family to which it belongs, it is subject to attacks by the Elm-leaf beetle. At least, I observe that many of the trees in the nurseries here are infested with that insect.

Flushing, N. Y. *M.*

The Columbian Exposition.

Japanese Horticulture at the Fair.

JAPAN makes four general horticultural exhibits at the Fair—a garden upon the island, a garden in the north wing of the Horticultural Building, a collection of models, drawings and pots in the dome gallery of the same building, and a display of wines in the south or viticultural pavilion. The garden upon the island lies beside the Japanese Building. It may be divided into two parts, one representing the garden proper, and the other showing a collection of nursery stock. To one who has read much of Japanese gardening and who expects to see a characteristic miniature landscape with grotesque trees, this creation is disappointing. The garden is simply a succession of low, smooth, grass-covered mounds with a few narrow walks winding about, and a hapless dearth of anything Japanesque in its planting. There are two obconical Pine-trees about four feet high, and perhaps twenty-five years old, but beyond these there is nothing striking among the plants, although there are good small specimens of Sciadopitys verticillata, Cryptomeria Japonica, and very small varieties of Azalea Indica. This so-called Japanese garden was planned by a builder who was concerned in the construction of the temple, and the Japanese gardener, Izawa, freely declares that it in no sense represents Japanese garden-art. The nursery portion of the island display suffers from too much land. There seemed to be land to spare upon this end of the island, and it was turned over to the Japanese, who had asked for less, and had also brought plants for a smaller area. Nevertheless, the exhibit has intrinsic merit, especially in showing some forty varieties of the Japanese Maple, Acer polymorphum, twenty-five of Tree Pæonies, and about 150 varieties of Iris Kæmpferi. Sterculia platanifolia, rarely seen as a temporary lawn-tree in the north, is also conspicuous. Two Maples, which are less than head-high and are about fifteen years old, are grafted with some twenty-five varieties each, and they presented a most unique combination of color in May and June.

The garden in the Horticultural Building is undoubtedly a good example of Japanese art. While it is only twenty-two by 140 feet in extent and aims to present landscape-features, it contains no less than 2,000 distinct plants. It represents such a garden as may be adjacent to a dwelling-house. A walk winds through the middle of the area lengthwise, crossing an arched bridge and pond near its middle. Upon either side of this central walk are miscellaneous collections of plants, so thickly planted as to nearly hide the earth. There is no attempt at greensward; and if the ground shows at all, it is covered with a rough porous rock (Ohio tuffstein) which soon assumes a greenish and mossy tint. The spaces between the higher plants are sometimes covered with low grass-like plants and dwarf forms of Azalea Indica. The mossy rock borders all the walks, and upon little mounds of it various dwarf and contorted trees are set, either in soil in the hollows, or in blue-lacquered pots. The water area extends fully one-third the length of the entire space. It originates in a square stone well near the northern extremity, the water being supplied from a pipe in the bottom. The water bubbles up in the center of the well, flows over the side and runs in a broad stream near the outer edge of the garden for a distance of several feet, when it broadens into an irregular fish-pond nearly twenty feet wide and as many feet long, dotted with picturesque islets and pots of Fern, and spanned by the arched bridge already mentioned. This bridge is a unique feature. Its bed is made of two curved log-sleepers with bark on, across which is laid a row of smaller logs, the cut ends presenting themselves to the observer. A dense layer of fagots or twigs is laid upon this corduroy to hold the dirt, which is now placed on, being held at the edges by a margin of the mossy stone. The edges of this bridge are thickly planted. On the rear, blue-green sprays of Juniperus littoralis project over the water, while in front there are large and small Azaleas, Ferns, and red-berried Ardisias. Long fern-rhizomes, tied in withes with moss inside, are bent and twisted into grotesque figures, which are suspended here and there, and in the moist atmosphere these have sent up tender fronds. Two immense stone lanterns of grotesque pattern comprise the architectural features of the garden.

A rustic box, about five feet long by three feet wide, standing upon a foundation of stones, shows a miniature landscape-garden. There are hills and dales, three bridges, five houses, a dwarf Thuya obtusa and Pinus densiflora, each many years old, five minature Ardisia-trees, and no less than twenty other plants in this little space, together with a large and irregular water-basin. This is a plan or model of a Japanese garden. It is such a plan as the Japanese gardener always expects to make before he proceeds to the improvement of grounds. It serves the purpose of a map.

There are many curious plants in this garden. The chief interest centres about two twisted trees of Thuya obtusa, which are three to four feet high, and a hundred years old. Dwarfed and contorted Pines and Maples, the latter often bearing many varieties in the same top, are also conspicuous. Small young Maple-trees, of diverse forms, are used to good effect in certain bays and angles. Bamboos, Irises, Azaleas and variegated Aucubas and Elæagnuses give color and spirit to the whole. This Japanese garden cannot be called beautiful, as Americans understand rural art, but it is curious and grotesque, and it is one of the best object-lessons in the art of patient and persevering garden-craft.

The wax or composition models of fruits and vegetables in the dome of the Horticultural Building are less perfect than many American casts, but they illustrate some peculiar types, especially the fingered Oranges and the Bamboo-sprouts. These sprouts spring from Bamboo-crowns, and they are boiled and eaten after the manner of asparagus. The normal sprout is about three inches through at the base and a foot long, tapering gradually to the tip. The leaves are tightly imbricated, the short, green tips spreading slightly, much after the manner of a close-husked ear of corn. Egg-plant fruits about half-matured, cucumbers, water-melon, the russet apple-like Japanese pears, pomegranates, pomelos, vinifera grapes, apples—some of them showing the work of the codlin-moth—and a variety of persimmons complete the collection. These

immature Egg-plant fruits are prepared by the Japanese by boiling, with sugar, when the flesh breaks down, forming a popular dish.

There are also dried fig-like persimmons, dried mushrooms and chestnuts in the display. Gaudy artificial flowers, showing cherries, pæonies and chrysanthemums, wall-charts and drawings of flowers, and a unique collection of ornamental flower-pots in terra cotta and in colors fill out the tables of this exhibition.

The Japanese wine exhibit is small and is confined to a single variety of red wine. The display also shows preserved truffles in small tin cans.

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Notes.

Mr. Charles Moore, the venerable director of the Botanic Garden at Sydney, New South Wales, has recently published a useful handbook of the flora of that country on the general plan of the colonial Floras published at the Royal Gardens of Kew.

At a social meeting of the American Pomological Society, held in connection with the Congress on Horticulture, August 17th, it was decided to hold the next regular meeting in San Francisco during the winter of 1894–5, and to ask all American horticultural societies to join in a grand excursion to the Pacific coast.

Just now many swamps and wet meadows in this region are purple with the bloom of the Spiked Loosestrife, Lythrum Salicaria. The bright color made by masses of this plant at this season suggests that it could be more abundantly used in parks and large grounds on the borders of lakes and similar situations.

The first part of Professor Trimen's *Handbook to the Flora of Ceylon*, from Ranunculaceæ to Anacardiaceæ, inclusive, has appeared. The work follows the line of Hooker's *Flora of British India*, the description of plants being in English. Synonyms are given with references to the literature of the subject and to the general and local distribution of Ceylon plants.

The grounds about the Horticultural Building at the World's Fair are now resplendent with bloom. One of the most attractive features is the old-fashioned garden in the rear of the building, shown by New York. Although it lacks the careless and provincial aspect of our grandmothers' gardens, it shows many of the plants which the older visitors knew as children, and it excites considerable happy comment.

We have in former years called attention to the value of Ceratostigma plumbaginoides, or, as it is generally called, Lady Larpent's Plumbago, as a low-growing, hardy plant for this climate. It has already been blooming for some time, and it will continue to show its deep blue flowers until frost, and its autumn foliage turns to rich carmine and crimson. It should not be neglected in rockeries or in other places where semi-prostrate and late-flowering hardy plants are needed.

A writer in the *Revue Horticole* announces the fact that Prunus Davidiana has produced fruit this season in the Jardin des Plantes, in Paris, where this beautiful flowering tree was introduced in 1865 by the Abbé David, who found it on the hills which surround the Imperial palace of Gehol, in Mongolia, and also in the neighborhood of Pekin. In this country this tree is one of the earliest of all the Peach tribe to flower. No plant of its class is hardier or more beautiful, but, although it flowers freely every spring, it is not known to have produced fruit here. The fruit is described as small, nearly spherical, covered with down, and, when fully ripe, of a yellowish color. The flesh, which is very thin, is easily separated from the nearly spherical deeply pitted nut.

We find in the *Journal of Horticulture* an interesting account of a Black Hamburg Grape-vine at Silwood Park, Ascot, which deserves to rank with the often-described giant vines at Speddoch, Manresa and Cumberland Lodge. The Silwood vine occupies a house 128 feet long and twelve feet wide, the entire roof being covered with rods and lateral stems. Its main trunk is over six feet high, with a girth of three feet and two inches, and it forks into two large limbs. The rods on which the fruiting branches run have a total length of 1,112 feet, and the number of fruit-clusters it now bears is 830, and they range from half a pound to three pounds in weight, amounting, at a fair estimate, to nearly 1,100 pounds in all. The age of the plant is not known with precision, but it is between 100 and 110 years old. It is a very vigorous vine still, with leaves of unusual size and berries also exceptionally large.

Clematis flammula is still covered with its clusters of white and fragrant flowers, and it seems to be an almost indispensable plant for late August. Our common wild Clematis, C. Virginiana, also continues to bloom in almost the same abundance, and, although its flowers are hardly as delicate as those of C. flammula, it is perhaps the most interesting of our native plants in bloom at this time except the Clethra. Its airy fruit-clusters, with their feathery tails, which appear later, add much to its value. The purple and fragrant solitary flowers of C. crispa are still appearing as they have been since June, though in no great abundance. They will continue, however, until frost. Besides its long flowering season, this Clematis is to be commended for the beauty of its variable foliage. The foliage of Clematis coccinea is more thin and open, so that it does not serve a good purpose where a thick screen is wanted, but its scarlet flowers are interesting, and, like those of C. crispa, they are produced throughout the entire season.

Something more than a year ago we gave some account of a crimson-flowered Cluster Rose which had been obtained indirectly from Japan by Messrs. Turner & Sons, of Slough, England, and which had been certificated in 1890 by the Royal Horticultural Society under the name of Engineer. In our description the Rose was said to bloom very freely, its long sturdy branches being covered with huge bouquets of compact blood-red flowers, and, altogether, it seemed one of the best of the many forms of Rosa multiflora which are represented in English gardens. In last week's *Gardeners' Chronicle* there is a picture of this Rose, which indicates that it is a very attractive plant. It was shown in the Horticultural Exposition at Paris as well as in the Temple Show and other English exhibitions, in all of which its merits were recognized, and it was pronounced the most beautiful hardy Rose of its kind which has been introduced for many years. The illustration shows it as a pillar Rose, but it is said to be equally beautiful for bedding when pegged down. We should be pleased to hear of any experience with it in this country.

Peaches of ordinary quality are abundant and cheap, but large fruit is somewhat scarce and high. California is sending Orange Cling peaches, which are very attractive in appearance, but altogether disappointing to the eater. These peaches do not rot or break down as the eastern peaches do, but their flesh seems to toughen into a leathery consistency. They last longer in the market here than fruit from orchards fifty miles away, and their appearance sells them at five cents each on the fruit-stands. Plums still continue abundant from California, the principal varieties being Grosse Prunes, Comedy Prunes, German Prunes, Bradshaw, Columbia and Duane's Purple. The California grapes now chiefly sold here are White Muscats, White Malagas, Rose of Peru and Chasselas de Fontainebleau, which is often sold as Sweetwater. Strawberry Pippins, Nyack Pippins and Orange Pippins are coming from the Hudson fruit region in abundance, but the Gravensteins still bring the highest prices among apples. The buyer can have a selection of Concord, Delaware, Niagara, Ives, Moore's Early, Champion and Hartford grapes. The best oranges are still those from Rodi, Italy, some 5,000 boxes having arrived last week, and they sell from $3.50 to $5.00 a box.

Immediately following the Congress on Horticulture at Chicago a movement was instituted to organize a General Horticultural Society to promote correspondence, the exchange of plants, seeds, books and other articles, and the general extension of fellowship among the horticulturists of the world. The organization of this body was practically completed at a meeting held in Mr. Samuels' office on August 25th. The scheme provides for three officers-at-large—president, first vice-president and secretary-treasurer. Each country is entitled to a vice-president and secretary-treasurer. The three general officers, together with the secretary-treasurer of the country in which the president resides, constitute a Committee on By-laws and also on Finance, while all the officers constitute an Executive Committee. The membership of the society consists of horticultural societies, which pay an annual fee of five dollars, and of individuals, who pay an initial fee of two dollars and a subsequent annual fee of one dollar. Only the three general officers are yet determined. These are P. J. Berckmans, Georgia, President; Henri L. de Vilmorin, Paris, First Vice-President; George Nicholson, Kew, England, Secretary-Treasurer. It is expected that one-third of all moneys collected in each country is to be retained in that country for the expenses of its own branch of the work, the remainder going into the hands of the Secretary-Treasurer.